

L3 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN
 AN 2000:755289 CAPLUS
 DN 133:323079
 ED Entered STN: 26 Oct 2000
 TI Composition for a nonwetable transparent coating and coated articles
 IN Guillaumon, Jean-Claude; Nabarra, Pascale Veronique
 PA Centre National d'Etudes Spatiales, Fr.
 SO Eur. Pat. Appl., 10 pp.
 CODEN: EPXXDW
 DT Patent
 LA French
 IC ICM C09D183-02
 ICS C09D183-04; C03C017-30
 CC 42-10 (Coatings, Inks, and Related Products)
 Section cross-reference(s): 57
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1046689	A1	20001025	EP 2000-401095	20000419 <--
	EP 1046689	B1	20030625		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	FR 2792323	A1	20001020	FR 1999-4890	19990419
	FR 2792323	B1	20010706		
	AT 243730	E	20030715	AT 2000-401095	20000419
PRAI	FR 1999-4890	A	19990419		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	EP 1046689	ICM	C09D183-02
		ICS	C09D183-04; C03C017-30
AB	Compns. for manufacture of nonwetable, antisoiling, transparent coatings, useful for transparent substrates such as glass, contain (a) a polydialkoxysiloxane, (b) a polysiloxane having reactive terminal groups, (c) a crosslinker, (d) optionally, colloidal silica, (e) a crosslinking catalyst.		
ST	crosslinkable polysiloxane nonwetable antisoiling transparent coating glass		
IT	Coating materials		
	(antisoiling; compns. a nonwetable antisoiling transparent coatings)		
IT	Organic glasses		
	Plate glass		
	RL: MSC (Miscellaneous)		
	(substrates; compns. a nonwetable antisoiling transparent coatings)		
IT	Coating materials		
	(transparent; compns. a nonwetable antisoiling transparent coatings)		
IT	Coating materials		
	(water-resistant; compns. a nonwetable antisoiling transparent coatings)		
IT	1185-55-3, Methyltrimethoxysilane		
	RL: TEM (Technical or engineered material use); USES (Uses)		
	(M 9100; compns. a nonwetable antisoiling transparent coatings)		
IT	18165-73-6, Diethyl silicate		
	RL: TEM (Technical or engineered material use); USES (Uses)		
	(PS 9120; compns. a nonwetable antisoiling transparent coatings)		
IT	78-10-4, Tetraethoxysilane		
	RL: TEM (Technical or engineered material use); USES (Uses)		
	(T 1807; compns. a nonwetable antisoiling transparent coatings)		
IT	7631-86-9, Silica, uses		
	RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)		
	(colloidal; compns. a nonwetable antisoiling transparent coatings)		

IT 681-84-5, T1980
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
 (compsns. a nonwetttable antisoiling transparent coatings)

IT 78-62-6, Dimethyldiethoxysilane 562-90-3, Silicon tetraacetate
 682-01-9, Tetrapropoxysilane 2031-67-6, Methyltriethoxysilane
 2944-70-9, Methylvinylldiacetoxysilane 3768-58-9,
 Bis(dimethylamino)dimethylsilane 4130-08-9, Vinyltriacetoxysilane
 13368-45-1, Bis(dimethylamino)methylvinylsilane 16230-35-6,
 Bis(N-methylbenzamido)ethoxymethylsilane 17689-77-9,
 Ethyltriacetoxysilane 18186-97-5, Dimethyltetramethoxydisiloxane
 18243-23-7, Dimethylacetoxysilane 18420-09-2, 1,1,3,3-Tetramethyl-1,3-
 diethoxydisiloxane 31692-79-2, PS 340.5 31900-57-9D,
 Dimethylsilanediol homopolymer, reactive group-terminated 97917-34-5, PS
 510
 RL: TEM (Technical or engineered material use); USES (Uses)
 (compsns. a nonwetttable antisoiling transparent coatings)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
 RE

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- (2) Anon; PATENT ABSTRACTS OF JAPAN 1998, V1998(13)
- (3) Daikin Ind Ltd; EP 0811669 A 1997 CAPLUS
- (4) Fujitsu Kk; JP 60254034 A 1985 CAPLUS
- (5) Fujitsu Ltd; EP 0112168 A 1984 CAPLUS
- (6) Kobayashi, H; WO 9836016 A 1998 CAPLUS
- (7) Magyar Tudomanyos Akademia; DE 3718451 A 1988 CAPLUS
- (8) Mitsubishi Chem Corp; JP 10212354 A 1998 CAPLUS
- (9) Mitsubishi Chemical Corporation; EP 0964020 A 1999 CAPLUS
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RN 1185-55-3
 RN 18165-73-6
 RN 78-10-4
 RN 7631-86-9
 RN 681-84-5
 RN 78-62-6
 RN 562-90-3
 RN 682-01-9
 RN 2031-67-6
 RN 2944-70-9
 RN 3768-58-9
 RN 4130-08-9
 RN 13368-45-1
 RN 16230-35-6
 RN 17689-77-9
 RN 18186-97-5
 RN 18243-23-7
 RN 18420-09-2
 RN 31692-79-2
 RN 31900-57-9D
 RN 97917-34-5

L3 ANSWER 2 OF 2 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
 AN 2001-051671 [07] WPIX
 DNC C2001-014368
 TI Non-wetttable transparent coatings for mineral and organic glass formed
 from a composition comprising a polydialkoxysiloxane, a polysiloxane with
 reactive end groups, a crosslinking agent and a curing catalyst.

DC A93 A95 G02 L01
 IN GUILLAUMON, J; NABARRA, P V; GUILLAUMON, J C
 PA (CNES) CENT NAT ETUD SPATIALES
 CYC 25
 PI EP 1046689 A1 20001025 (200107)* FR 10 C09D183-02 <--
 R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
 RO SE SI

FR 2792323 A1 20001020 (200107) C09D183-06
EP 1046689 B1 20030625 (200349) FR C09D183-02 <--
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
DE 60003489 E 20030731 (200357) C09D183-02
ADT EP 1046689 A1 EP 2000-401095 20000419; FR 2792323 A1 FR 1999-4890
19990419; EP 1046689 B1 EP 2000-401095 20000419; DE 60003489 E DE
2000-00003489 20000419, EP 2000-401095 20000419
FDT DE 60003489 E Based on EP 1046689
PRAI FR 1999-4890 19990419
IC ICM C09D183-02; C09D183-06
ICS C03C017-28; C03C017-30; C09D183-04
ICI C09D183-06, C09D183:08
AB EP 1046689 A UPAB: 20010202
NOVELTY - Composition for forming non-wettable transparent coatings
comprising (a) a polydialkoxysiloxane, (b) a polysiloxane with reactive
end groups, (c) a crosslinking agent, (d) optionally, colloidal silica and
(e) a curing catalyst.
DETAILED DESCRIPTION - Composition for forming non-wettable
transparent coatings comprising (a) a polydialkoxysiloxane, (b) a
polysiloxane with reactive end groups, (c) a crosslinking agent, (d)
optionally, colloidal silica and (e) a curing catalyst.
USE - Especially for applying a non-wettable transparent coating to
mineral or organic glass, especially aircraft cockpit glass and windows,
motor vehicle windscreens and windows, glazing in buildings, etc.
ADVANTAGE - The coatings have excellent transparency (transmission
greater than 98 % at 300-800 nm), high hardness and high abrasion
resistance, these properties remaining substantially unchanged during
ageing of the coating. The coatings are non-wettable and do not encourage
the sticking of dust, dirt and other soiling such as fingerprints which
occurs with untreated glass, so that good visibility through coated
glazing is maintained for long periods.
Dwg.0/0
FS CPI
FA AB
MC CPI: A06-A00B; A06-A00E1; A08-D01; A12-B05; G02-A05; L01-G04B; L01-L02

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PTO 04-5114

CY=EU DATE=20001025 KIND=A1
PN=1 046 689

NON WETTABLE, TRANSPARENT COATING COMPOUND, AND COATED ITEMS OBTAINED
[Composition de revêtement transparent non-mouillable et articles
revêtus obtenus.]

Jean-Claude Guillaumon, et al.

UNITED STATES PATENT AND TRADEMARK OFFICE
Washington, D.C. September 2004

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APPLICATION DATE	(22): 20000419
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INTERNATIONAL CLASSIFICATION	(51): C09D 183/02, C09D 183/04, C03C 17/30
DOMESTIC CLASSIFICATION	(52):
PRIORITY COUNTRY	(33): FR
PRIORITY NUMBER	(31): 9904890
PRIORITY DATE	(32): 19990419
INVENTOR	(72): Jean-Claude Guillaumon and Pascale Nabarra
APPLICANT	(71): Centre National d'Etudes Spatiales, FR
TITLE	(54): NON WETTABLE, TRANSPARENT COATING COMPOUND, AND COATED ITEMS OBTAINED
FOREIGN TITLE	(54A): Composition de revêtement transparent non-mouillable et articles revêtus obtenus

The present invention pertain to transparent, non wetable, /2*
and spot resistant coating compound, and the items having a hardened
coating obtained from this compound.

The invention pertains in particular to mineral, or organic glass
items, used in particular in the aeronautical sector (cabin windows,
cockpit), the automobile sector (windshield, windows), or the building
sector (windows), coated with such a coating.

The wetness nature is linked to the spreading, and adherence
ability of polar, and non polar liquid films to the surface of
substrates, which is directly dependant on the surface energy of these
substrates, and liquids' surface tension.

For example, in the case of water, with a high surface tension,
its spreading ability on the surface of glass is affected by a high
energy of this surface.

The wettability also designates the tendency of substrates to
retain dirt, or spots (traces of finger, for example). This spots
cause a decrease in the transparency of the glass which can be
bothersome.

To decrease the wettability of glass, it is therefore necessary
to decrease its surface energy by applying an adequate coating.

There are different types of non wetable coatings described in
various patents.

*Numbers in the margin indicate pagination in the foreign text.

However, these coatings have a tendency to deteriorate over time due to natural aging (humidity, pollution, solar ultraviolet rays), but also due to poor resistance to abrasion. These deteriorated coatings lose their transparency properties, which causes them to become unutilizable.

The present invention's goal is to provide a coating compound for items, in particular in glass, which, after hardening, gives a coating which is perfectly transparent in the visible (transmission greater than 98% between 300 and 800 nm), non wettable, with superior hardness, and which possess a good resistance to abrasion, these properties being not substantially altered over time.

The invention pertains to a transparent, non wettable coating compound, including (a) a polydialkoxysiloxane, (b) a polysiloxane with reactive terminal groups, (c) a reticulating agent, (d) colloidal silica, and (e) a hardening catalyst.

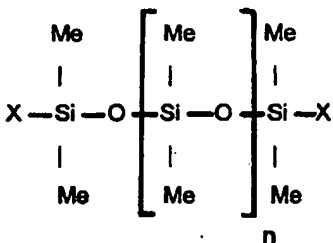
The polydialkoxysiloxanes (a) which can be used in the invention have the formula $(\text{Si}(\text{OR})_2\text{O})_n$ in which:

R = a methyl, or ethyl radical, and N is greater than 3.

If desired, these polydialkoxysiloxanes can be combined with dialkoxymetallics, for example diethoxysiloxane.

The polydiethoxysiloxane is the preferred constituent because of its better reactivity.

The general formula of the polysiloxanes with reactive terminal groups used in the invention is:



in which n is greater than 1, and X is a reactive grouping, for example -H, -CH = CH₂ - OH, -Cl, -BR, -O-Me, -O-Et, -O-Ac, -N=Me₂, -N=Et₂, -N=Pr₂, -O-N=CR₂, and similar groups.

The reticulating agent (c) used in the invention can be any organic silicon compound with at least two reactive groups. For example, the following compounds can be mentioned:

dimethyldiacetoxysilane, vinylmethyldiacetoxysilane, ethyltriacetoxysilane, methyltriacetoxysilane, vinyltriacetoxysilane, silicon tetraacetate, dimethyldiethoxysilane, 1,1,3,3-tetramethyl-1,3-diethoxysilane, methyltriethoxysilane, methyltrimethoxysilane, dimethyltetramethoxydisiloxane, tetraethoxysilane, tetramethoxysilane, tetrapropoxysilane, bis(N-methylbenzylamido)-ethoxymethylsilane, bis(dimethylamino)dimethylsilane, bis(diethylamino)methylvinylsilane.

The proportions of the constituents (a), (b), and (c) can vary greatly. As an indication, they can go from 5 to 60% for constituent (a), 5 to 90% for constituent (b), and 5 to 60% for constituent (c), the total of (a), (b), and (c) making 100%. The constituent (d), the colloidal silica, is optional, and can be added in an amount going

from 0 to 50% in relation to the sum of the constituents (a), (b), and (c).

In order to accelerate the polymerization at room temperature, and/or at high temperature, if desired, a catalyst (e) can be used, or mixture of catalysts, in a proportion going from 0.01 to 5% in weight in relation to the sum of the constituents (a), (b), and (c).

A non restrictive list of the catalysts which can be used is as follows:

- organic tin salts, or organo-tin compounds like diacetate or dibutyl-tin, dilaurate or dibutyl-tin, tin octoate, dioctate, or dibutyl-tin, tetrabutyl-tin, dimethoxydibutyl-tin, etc...

- organic zinc salts like zinc octoate, zinc acetate, etc...

- organic titanium compounds like: tetrabutyl-titanium, /3
tetraethoxytitanium, tetraoctyltitanium, tetramethoxytitanium, tetra n-propoxytitanium, etc...

- platinum complexes with a siloxane such as
divinyltetramethyldisiloxane, cyclovinylnmethyilsiloxane, etc.

The colloidal silica is optional, and incorporated into the mixture in order to increase the resistance to abrasion, and scratching, if desired. However, an amount of 50% in weight of silica in relation to the constituents (a) + (b) + (c) should not be exceeded, because that would lead to the appearance of small cracks, and a deteriorated transparency.

The colloidal silica is added to the other constituents in suspension in a solvent (toluene, xylene, alcohol, etc...) The diameter of the silica particles is, preferably, not greater than 20 nanometers in order to obtain an optima transparency.

The invention's compound can be applied to substrates which are glass, or other materials, in a thickness of several micrometers to several tenths of micrometers. These coatings can be applied in one or several successive layers.

If desired, or necessary, the invention's coatings can be applied in a primary anchoring layer, or after pre-treating the substrate's surface.

Also, if desired, for reasons of application ease, or others, the coating compounds used in the invention can be diluted before application, at a rate of dry material going from 1 to 80% in weight, by means of a solvent like: aliphatic hydrocarbons, for example, hexane, heptane, octane, cyclohexane, etc..., aromatic hydrocarbons, for example, benzene, toluene, xylene, styrene, etc..., halogenated hydrocarbons, for example trichloromethylene, methyl chloride, chloroform, etc..., or mixtures of these solvents.

Applying a coating can be done with a paint gun, a brush, or any know technique. The hardening is usually done at room temperature, but using a heater is possible to accelerate the hardening.

The following non restrictive examples are given in order to illustrate the invention.

EXAMPLE 1

The mixture obtained from a polydiethoxysiloxane containing 40 to 42% of SiO_2 (viscosity 4 to 5 mPa.s) (Ref. PS 9120 from PETRARCH SYSTEMS, INC., USA) (3 parts in weight), of methyltrimethoxysilane (Ref. M9100 from PETRARCH SYSTEMS, INC., USA) (5 parts in weight), of polydimethylsiloxane with a silanol terminal, with a molecular weight situated between 1500 and 2000) (viscosity 45 to 85 mPa.s) (Ref. PS 340.5 from PETRARCH SYSTEMS, INC., USA) (0.5 part in weight), and of dibutyl-tin diacetate (MERCK) (0.1 part in weight), is applied with a gun to a pre-treated mineral glass plate in order to obtain a 5 micrometer thick coating, after hardening at room temperature. The pretreatment applied to the glass plate in this example, and following examples consists of a chemical cleaning of about 1 hour with an alkaline solution sold under the name RBS 35 by the RBS Company, Germany.

The optical transmittance rating of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching is measured by the steel wool test which consists of doing 10 back, and forth movements, using a square of about 3 cm by 3 cm of this material, rubbing the coated glass in the direction of the fibers with constant pressure during this operation. The glass is then wiped with a dry cloth, then rinsed with alcohol, then the state of the coating is visually evaluated, and a grade using the following grading system is given to it:

0 no scratch is seen.

1 glass is not scratched very much (0 to 5 scratches).

2 glass is somewhat scratched (up to 20 scratches).

3 glass scratched quite a lot (number of scratches less than 50).

4 glass very scratched (number of scratches greater than 50).

5 glass equal to or worse than the uncoated substrate.

The value measured for the example 1's coating is 2.

The coating's wettability can be measured simply using the following operating procedure:

1 drop of deionized water is spread on the surface of a perfectly cleaned glass plate, then dried with alcohol, kept in a horizontal position.

In the case of an untreated glass, the water spreads, and the diameter of the deposit is 12 mm, in the case of the treated substrate, the diameter of the spot does not exceed 5 mm, which clearly shows the non wettable nature of the coating described in example 1.

EXAMPLE 2

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), methyltrimethoxysilane (1 part in weight), polydimethylsiloxane with a silanol terminal, (5 parts in weight), and of dibutyl-tin diacetate (0.1 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 99% between 300 and 800 nanometers.

The resistance to scratching using the test described in /4
Example 1 is situated between 2, and 3.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 3

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), methyltrimethoxysilane (5 parts in weight), polydimethylsiloxane with a silanol terminal, (5 parts in weight), and of dibutyl-tin diacetate (0.1 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 99% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is 2.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 4

The mixture obtained from a polydiethoxysiloxane (4 parts in weight), methyltrimethoxysilane (5 parts in weight), polydimethylsiloxane with a silanol terminal, (5 parts in weight), and of dibutyl-tin diacetate (0.1 part in weight), is applied with a gun

to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is situated between 2 and 3.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 5

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), methyltrimethoxysilane (10 parts in weight), polydimethylsiloxane with a silanol terminal, (5 parts in weight), and of dibutyl-tin diacetate (0.1 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is 2.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 6

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), methyltrimethoxysilane (10 parts in weight),

polydimethylsiloxane with a silanol terminal, (5 parts in weight), colloidal silica (0.2 part in weight) and of dibutyl-tin diacetate (0.1 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is 2.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 7

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), methyltrimethoxysilane (10 parts in weight), polydimethylsiloxane with a silanol terminal, (5 parts in weight), colloidal silica (0.6 part in weight) and of dibutyl-tin diacetate (0.1 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is situated between 1 and 2.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 8

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), methyltrimethoxysilane (10 parts in weight), polydimethylsiloxane with a silanol terminal, (5 parts in weight), colloidal silica (1 part in weight) and of dibutyl-tin diacetate (0.1 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is situated between 1 and 2.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm. /5

EXAMPLE 9

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), methyltrimethoxysilane (10 parts in weight), polydimethylsiloxane with a silanol terminal, (5 parts in weight), colloidal silica (5 parts in weight) and of dibutyl-tin diacetate (0.1 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is situated between 1 and 2.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 10

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), methyltrimethoxysilane (10 parts in weight), polydimethylsiloxane with a silanol terminal, (5 parts in weight), colloidal silica (10 parts in weight) and of dibutyl-tin diacetate (0.1 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is 1.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 11

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), tetramethoxysilane (Ref. T1980 from PETRARCH SYSTEMS, INC., USA) (5 parts in weight), polydimethylsiloxane with a dimethylaminopropyl terminal, (Ref. PS 510 from PETRARCH SYSTEMS, INC., USA), with a molecular weight of 2500, and a viscosity of 50 mPa.s (5 parts in weight), and of dibutyl-tin diacetate (0.02 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is 2.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 12

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), methyltrimethoxysilane (5 parts in weight), polydimethylsiloxane with a silanol terminal (3 parts in weight) polydimethylsiloxane with a dimethylaminopropyl terminal, (2 parts in weight), and tin octoate (MERCK) (0.03 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is 2.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 13

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), methyltrimethoxysilane (5 parts in weight), polydimethylsiloxane with a dimethylaminopropyl terminal, (5 parts in weight), colloidal silica (5 parts in weight), and tin octoate (MERCK) (0.05 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is 1.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 14

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), tetraethoxysilane (Ref. T1807 from PETRARCH SYSTEMS, INC., USA) (10 parts in weight), polydimethylsiloxane with a silanol terminal (5 parts in weight) colloidal silica, (5 parts in weight), and tin octoate (0.05 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 /6 and 800 nanometers.

The resistance to scratching using the test described in example 1 is 1.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

EXAMPLE 15

The mixture obtained from a polydiethoxysiloxane (5 parts in weight), tetraethoxysilane (10 parts in weight), polydimethylsiloxane with a silanol terminal (3 parts in weight), polydimethylsiloxane with a dimethylaminopropyl terminal (2 parts in weight), colloidal silica, (5 parts in weight), and tin octoate (0.02 part in weight), is applied with a gun to a pre-treated mineral glass plate as in example 1, in a thickness of 5 micrometers (as measured after hardening at room temperature).

The optical transmittance of the coating is 98% between 300 and 800 nanometers.

The resistance to scratching using the test described in example 1 is 1.

A drop of deionized water spread on the coating's surface does not spread, and its diameter is in the range of 5 mm.

It is clear that the production methods are only examples, and that they can be modified, in particular by substituting equivalent techniques, without leaving the invention's scope.

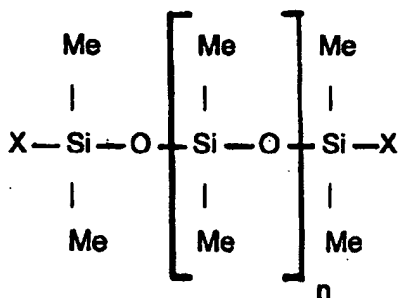
Claims

1. Transparent, non wettable, coating compound containing (a) a polydialkoxysiloxane, (b) a polysiloxane with reactive terminal groups, (c) a reticulating agent, (d) colloidal silica, and (e) a hardening catalyst.

2. Compound according to Claim 1, characterized by the fact that the polydialkoxysiloxane (a)'s formula is $(\text{Si}(\text{OR})_2\text{O})_n$ in which:

R = a methyl, or ethyl radical, and N is greater than 3.

3. Compound according to Claim 1, characterized by the fact that the general formula of the polysiloxane (b) with reactive terminal groups is:



in which n is greater than 1, and X is a reactive grouping, for example -H, -CH = CH₂ - OH, -Cl, -BR, -O-Me, -O-Et, -O-Ac, -N=Me₂, -N=Et₂, -N=Pr₂, -O-N=CR₂, and similar groups.

4. Compound according to Claim 1, characterized by the fact that the reticulating agent (c) is chosen among the following compounds: dimethyldiacetoxysilane, vinylmethyldiacetoxysilane, ethyltriacetoxysilane, methyltriacetoxysilane, vinyltriacetoxysilane, silicon tetraacetate, dimethyldiethoxysilane, 1,1,3,3-tetramethyl-1,3-diethoxysilane, methyltriethoxysilane, methyltrimethoxysilane, dimethyltetramethoxydisiloxane, tetraethoxysilane, tetramethoxysilane, tetrapropoxysilane, bis(N-methylbenzylamido)-ethoxymethylsilane, bis(dimethylamino)dimethylsilane, bis(diethylamino)methylvinylsilane.

5. Compound according to Claim 1, characterized by the fact that the catalyst is chosen among the organic tin salts, the organo-tin compounds, the organic zinc salts, the organic titanium compounds, and the platinum complexes with a siloxane.

6. Compound according to any one of Claims 1 to 5, characterized by the fact that it includes in weight, 5-60% of constituent (a), 5-

90% of constituent (b), and 5-60% of constituent (c), the total of (a), (b), and (c) making 100%.

7. Compound according to Claim 6, characterized by the fact that it includes, in addition, up to 50% in weight of colloidal silica in relation to the total of (a), (b), and (c).

8. Compound according to Claim 6 or 7, characterized by the fact that it includes, in addition, 0.01 to 5% in weight of a catalyst in relation to the total of (a), (b), and (c).

9. Item with a non wettable, transparent coating characterized by the fact that said coating was obtained by /7 hardening a layer, applied to said item, of a coating compound as defined by any one of the Claims 1 to 8.

10. Item according to Claim 9, characterized by the fact that it is in organic, or mineral glass.